SENIOR INTERAGENCY GROUP (SPACE)
SPACE LAUNCH POLICY WORKING GROUP

ISSUE PAPER
ON
FY84 BUDGET ISSUES

ISSUE: Should Orbiter production capability, in the form of the initiation of a fifth Orbiter, be supported in the FY84 budget?

BACKGROUND:

By 1969, NASA had adopted a program plan to develop a manned Space Transportation System (STS) based largely on reuseable components; this system was conceived to provide cost-effective, routine, manned access to space. Economics and politics, as well as technology, were all critical factors in the decision process that led to President Nixon's approval of the STS development in 1972.

As a part of this decision, all Expendable Launch Vehicles (ELV's), with the exceptions of the Scout and Saturn V vehicles, were to be phased out. The cost effectiveness of the STS was predicated on maximum utilization of the Shuttle over its operational life.

The question of the number of Orbiters required for an effective STS fleet was the subject of intense scrutiny by NASA, Congress, and various Administrations for most of the 1970's. Original planning envisioned a five-Orbiter fleet. The estimates of STS demand and the numbers of Orbiters to fulfill a given demand have fluctuated through the life of the program. These fluctuations have lead to a series of reviews of the question of fleet size.

In preparation for the FY 1977 budget, the Office of Management and Budget (OMB) undertook a review of the STS mission model and studied how many Orbiters beyond the first two were needed. To support the OMB review, NASA and the DOD jointly reviewed the requirements for Orbiters and issued a position statement that five Orbiters were essential to meet National requirements. The Ford Administration did decide that five Orbiters were essential to the Space Transportation System.

In 1977, the Carter Administration, again reviewed the question of Orbiter fleet size. The resulting position was that funding for a restricted four-Orbiter fleet would be requested by NASA. During subsequent consideration of the FY 78 budget, the Senate authorization stated that: (1) a five Orbiter fleet was an option which should be kept open; and that (2) interrupting production of Orbiters between the fourth and fifth Orbiter would have cost penalties. In February 1980, NASA testified before Congress that, due to slips in all parts of the STS program, a delay in fifth-Orbiter funding until FY 1982 would probably not cause substantial penalties. However, NASA's testimony in both the FY 82 and FY 83 budget hearings underscored the need to maintain Orbiter production and the need to commit to the fifth Orbiter as soon as possible.

National Space Policy (NSDD-42) states that:

- The United States is fully committed to maintaining world leadership in space transportation with an STS capacity sufficient to meet appropriate National needs.
- The STS program requires sustained commitments by all affected departments and agencies.
- Major changes to the STS program capabilities will require Presidential approval.
- The STS is the primary U.S. Government space launch system.

Space Assistance and Cooperation Policy (NSDD-50) states that:

- U.S. space launch assistance will be available to interested countries, international organizations, or foreign business entities for those spacecraft projects which are for peaceful purposes.

47 United States Code 721(b), Communications Satellite Act of 1962.

This public law directs NASA to:

> "furnish to the corporation (COMSAT), on request and on a reimbursable basis, satellite launching and associated services requested for the establishment, operation and maintenance of the communications satellite system approved by the Commission (FCC)."

The fourth Orbiter is currently scheduled for December 1984 delivery. Unless a decision is made to continue Orbiter production in FY 84, the production base of facilities, personnel, subcontractors and vendors will be closed down.

DISCUSSION:

The decision for or against the fifth Orbiter is in reality a decision whether or not to truncate the production program and, therefore, the system capability at a point which will assure that, under the most favorable conditions, the maximum flight rate will be limited to approximately 26 flights per year. The second equally important consideration is the question of the loss of an Orbiter and, without a production base, can an operationally viable and responsive system, capable of absorbing problems and contingencies, be assured to meet U.S. launch requirements?

Demand & Capacity

Many projections of both launch demand and Shuttle system capacity have been made during the past 10 years. Current projections of demand and capacity indicate that it is probable that by 1988 system demand will approximate the capacity of our presently planned four-Orbiter fleet, providing there are no major operational problems reducing that capacity. The fact is, however, that 5 to 15-year projections of demand in an environment as dynamic as space are not reliable enough to use as a major argument on this issue. Similarly, NASA's first five launches have not provided an adequate data base to use for sound projections of capacity over the manifest period. The fundamental question which must be decided is: is it wise today to dismantle the capability to produce and repair the key element of the primary U.S. Government launch system?

This issue must be clearly faced by those government users who are beginning to develop spacecraft compatible only with the Shuttle and to plan program operations dependent upon the unique capabilities provided by the Shuttle. It must also be faced by commercial and foreign users who have committed to use of this capability.

Other Issues

Prematurely constraining the U.S. to a four-Orbiter fleet could erode confidence in the STS as a viable, dependable approach to space transportation. Foreign nations' perception of the U.S. as a questionable source of launch services may be reinforced; we must offer them a service that is available and reliable to their needs as they, not we, perceive them. Both U.S. and foreign commercial customers could also view the STS capacity as inadequate to assure firm launch dates. The business community is primarily concerned with schedules; significant launch delays rapidly translate into large economic penalties. Perception that the U.S. is turning away from its commitment to a fully exploitable STS could accelerate the transition of foreign and commercial customers from STS planning to other options.

Abandoning the reimbursable market would constitute an abrupt change in policy and would place the entire burden of STS operations on the U.S. Government. This will seriously undermine the entire concept of a viable Shuttle based Space Transportation System.

CONCLUSIONS:

National Space Policy commits us to maintaining U.S. world leadership in space transportation.

To maintain world leadership a strong, responsive, reliable and cost effective STS operation must be maintained.

The U.S. Government cannot prudently abandon its highly successful ELV capability, as currently planned by FY 88, transition totally to the STS as its only access to space; abandon the production base for Orbiters concurrently and remain a realistic world leader in space transportation.

Any actions which result in turning Western and third world countries away from the U.S. is counter to U.S. policy and interests. The development of the STS was undertaken to meet the demand of the entire mission model, including the sale of STS services to commercial and foreign customers.

The STS was intended to universally serve U.S. Government, U.S. commercial and authorized foreign governments and foregin commercial customers. For the U.S. Government to turn only to its own needs at this time and abandon the commercial and foreign market would constitute an abrupt change in policy and be counter to U.S. interests as it would increase the costs to the U.S. Government users. Any actions that result in increased operations costs to the U.S. Government should be avoided.

Five STS flights provide insufficient data to make reasoned and confident decisions on Orbiter fleet size. More experience is necessary to firmly assess such critical factors as turnround time, system availability, periodic maintenance, attrition and demand. Prudence and sound managemnt requires maintaining all STS production capabilities until solid assessments of these critical factors can be made.

While a decision at this time to allow the Orbiter production capability to lapse is considered inappropriate because of the many uncertainties that preclude definitive analysis, a decision to proceed beyond a fifth-Orbiter commitment is inappropriate for the same reasons and unnecessary at this time.

A balanced, low-risk option should be selected that preserves basic production capabilities, assures maximum insensitivity to errors in projecting system capabilities, as well as demand, and yet retains the flexibility to adopt new options when firm data is available. NASA, as the program manager, is responsible for evaluating programmatic options to implement the best acquisition and operational strategies.

OPTIONS:

The NASA FY 84 budget request includes the funding to produce and deliver a fifth Orbiter. The fifth-Orbiter funding is an issue in the preparation of the President's FY 84 budget request.

NASA outlined three options--close out Orbiter production capability, maintain Orbiter production capability and continue full Orbiter production.

I. Close-Out Orbiter Production Capability

This option shuts down the major subcontractors and prime contractors production line tooling and assembly fixtures and skills for producing major component assemblies (i.e., wings, etc.) upon delivery of the fourth Orbiter.

PRO

Offers near-term budget reductions of $120 to $350M per year for a total savings over 5 years of $1.6B for the Orbiter and collateral savings of $375M.

CONS

Limits STS capability to a maximum of 26 flights per year through at least 1992. Lead time for Orbiter delivery would increase to 6 to 7 years from new startup.

Costs to restart Orbiter production and delivering a fifth Orbiter would be significantly higher. Loss of jobs for approximately 6,600 direct people in FY 1984.

II. Maintain Orbiter Production Capability

This option maintains critical Orbiter production capabilities, i.e., production line tooling, assembly fixtures and skills to produce major structural assemblies such as wings, mid-bodies, etc.

PRO

The capacity to produce major assemblies is maintained while postponing the fifth-Orbiter decision until STS uncertainties are resolved. If additional Orbiters are not required, there can be a significant cost avoidance depending upon the timing of the decision.

This option delivers major modular assemblies and maintains repair/maintenance structural capability. The generic production line is available to respond to major repairs and structural maintenance needs. About $100M is postponed from the FY 84 budget.

CON

This option does not maintain the prime contractors final production assembly line (i.e., the capability to install and assemble major structural elements into an Orbiter). Some structural and assembly critical skills will be lost. Total cost of an Orbiter, when ordered, will be higher.

III. Continue Full Orbiter Production

PRO

This option delivers an Orbiter in late 1988 and hedges uncertainties in the program by bringing on line a reserve capacity at the earliest opportunity and the lowest cost. The generic production base is available for an additional 4 years to respond to major repairs and structural maintenance needs. If experience shows the Orbiter is not required, unassembled components are valuable as modules and spares.

CON

Cost of $200M in constrained FY 84 budget.

RECOMMENDATIONS:

Based on the conclusions of this study, we recommend continuing full Orbiter production (NASA Option III). NASA's plan to proceed with FY 84 funding of a fifth Orbiter satisfies the Working Group's concern that maintaining full Orbiter production capability is required.